

Notice of Allowability

Application No.

10/722,946

Examiner

Shermanda L. Williams

Applicant(s)

BEKKEDAHN ET AL.

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 3/22/2007.
2. ☒ The allowed claim(s) is/are 1-3.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

DETAILED ACTION

Response to Amendment

This Office Action is responsive to the Amendment After Non-Final Rejection filed on March 22, 2007. Claims 1-3 are allowable for the reasons as stated in previous correspondence and reiterated below. Claims 4 and 5 have been canceled.

1. The following is an examiner's statement of reasons for allowance:

The present invention claims a fuel cell having a partially hydrophobic porous carbon fluoropolymer particulate composite diffusion layer disposed between at least one hydrophilic substrate layer and the membrane electrode assembly where the diffusion layer comprises about 10 percent fluoropolymer by weight.

The closest prior art of record, Dufner et al. (US Pat. No. 6,024,848) discloses a particulate composite diffusion layer disposed between the hydrophilic substrate layer and the membrane electrode assembly. The diffusion layer comprises a hydrophilic phase as well as a hydrophobic phase. The hydrophilic phase comprises approximately 30 to 70 percent by weight carbon black and about 70 to 30 percent by weight of NAFION (a proton exchange resin which is a fluoropolymer). See Column 6, Line 51 through Column 7, Line 22). The hydrophobic phase comprises approximately 65 to 35 percent of a hydrophobic polymer by weight and 35 to 65 percent of carbon black by weight. However, Dufner et al. does not disclose or suggest that the total amount of the fluoropolymer material (to include NAFION and the hydrophobic polymer) in the diffusion layer is about 10 percent by weight of the diffusion layer.

The present invention also claims a fuel cell with a diffusion layer disposed between at least one of the hydrophilic substrate layer and the membrane electrode assembly with the thickness of the diffusion layer being within the range of more than 5 microns and less than 25 microns. The closest prior art of record, Dufner et al. (US Pat. No. 6,024,848) discloses a diffusion layer (44 and 48 in Figure 2) between the hydrophilic substrate layer (46 and 50 in Figure 2) and the membrane electrode assembly (30, 36, and 38 in Figure 2) but Dufner et al. does not disclose or suggest that the thickness of the diffusion layer is in the range of more than 5 microns and less than 25 microns. On page 21 line 14, the applicant discusses the significance of the thickness of the diffusion layer in relation to the removal of product water.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shermanda L. Williams whose telephone number is (571) 272-8915. The examiner can normally be reached on Mon.-Thurs. 7 AM - 4:30 PM and alternating Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


SUSY TSANG-FOSTER
PRIMARY EXAMINER